

What is claimed is:

1. A semiconductor device comprising:
a semiconductor substrate which has a major surface;
5 a MOS transistor which has a gate and first and second diffusion regions
and which is formed on the major surface; and
a laminated structure of a SOG layer, said laminated structure being
composed of a base layer and a surface layer formed on the base layer and being
formed over said MOS transistor; the surface layer being denser than the base
10 layer.
2. A semiconductor device as set forth claim 1, wherein the laminated
structure has a first contact hole defined therein, the first contact hole exposing
the first diffusion region of said MOS transistor; and
15 a first conductive material formed within the first contact hole.
3. A semiconductor device as set forth claim 2, wherein the first diffusion
region is a source or a drain of said MOS transistor.
- 20 4. A semiconductor device as set forth claim 2, further comprising;
said laminated structure has a second contact hole defined therein, the
second contact hole exposing the second diffusion region of said MOS transistor;
and
a second conductive material formed within the second contact hole.
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5. A semiconductor device as set forth claim 4, wherein the second
diffusion region is a source or a drain of said MOS transistor.

6. A semiconductor device as set forth claim 5, wherein the first conductive material is a bit line and the second conductive material is an electrode of a capacitor.

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7. A method of fabricating a semiconductor device comprising:
forming a SOG layer over a MOS transistor formed on a semiconductor substrate;
converting a surface portion of the SOG layer into to a dense layer which
10 is denser than a bottom portion of the SOG layer;
removing a first portion of the dense layer to expose a surface of the bottom portion of the SOG layer by a first etching;
removing a second portion which corresponds to the exposed surface of the bottom portion of the SOG layer to expose a diffusion region of the MOS
15 transistor by a second etching; and
forming a conductive material within a space in which the first and second portions are removed.

8. A method of fabricating a semiconductor device as set forth claim 7,
20 wherein said converting step comprises implanting ions into the surface portion of the SOG layer.

9. A method of fabricating a semiconductor device as set forth claim 7, wherein the first etching is an anisotropic etching and the second etching is an
25 isotropic etching.

10. A semiconductor device comprising:

a semiconductor substrate which has first and second regions formed on a major surface thereof;

a first insulating layer which is formed over the first region;

5 a dummy pattern which has a predetermined shape and which is formed on said first insulating layer;

a first SOG layer which is formed on side surfaces of said dummy pattern and the first insulating layer;

10 a second SOG layer which is formed on a top surface of said dummy pattern and said first SOG layer, said second SOG layer being denser than said first SOG layer; and

a second insulating layer which is formed on said second SOG layer,

wherein said first and second insulating layers and said first and second SOG layers are exposed at a boundary between the first region and the second region.

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11. A semiconductor device as set forth claim 10, wherein the second region is a grid line.

20 12. A semiconductor device as set forth claim 10, further comprising a fuse element which is formed over the second region.

13. A semiconductor device comprising:

a semiconductor substrate which has first and second regions formed on a major surface thereof, the second region surrounding the first region;

25 a first insulating layer which is formed over the second region;

a dummy pattern which has a frame shape surrounding the first region and which is formed on said first insulating layer;

a first SOG layer which is formed on side surfaces of said dummy pattern and the first insulating layer;

a second SOG layer which is formed on a top surface of said dummy pattern and said first SOG layer, said second SOG layer being denser than said
5 first SOG layer; and

a second insulating layer which is formed on said second SOG layer,

wherein said first and second insulating layers and said first and second SOG layers are exposed at a boundary between the first region and the second region.

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14. A semiconductor device as set forth claim 13, further comprising a fuse element which is formed over the first region.

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